

A Review of Microlepidoptera



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Past divisions of Lepidoptera

- **Microlepidoptera**
 - HW often 3 anal veins
 - about 45% of described Lepidoptera
- **Macrolepidoptera**
 - large butterflies and moth
 - 1 or 2 anal veins
- **Heterocera**
 - (various antennae)
 - moths
- **Rhopalocera**
 - (clubbed antenna)
 - butterflies

Phylogeny of Lepidoptera

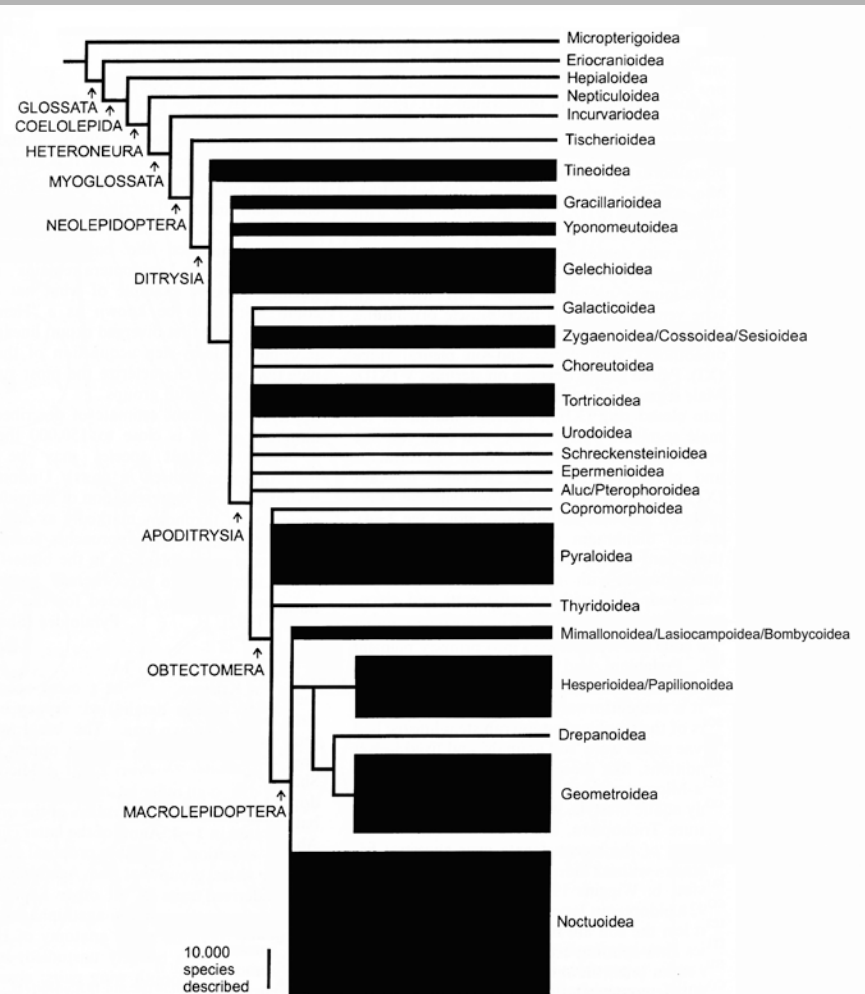
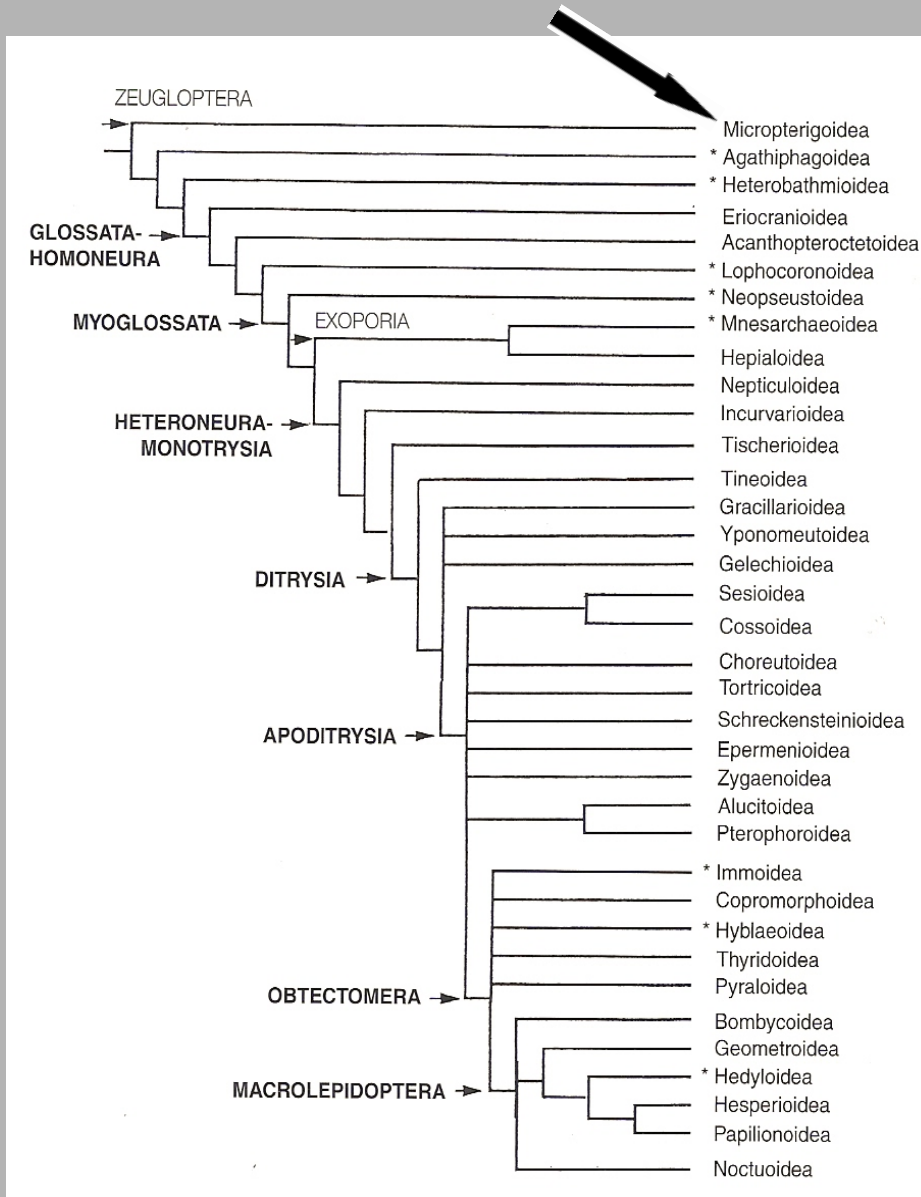


Fig. 1. Phylogenetic relationships of superfamilies of Lepidoptera present in the United States and Canada. Width of lines based on number of species worldwide (see scale bar). Modified from Kristensen and Skalski (1998).

Suborder Zeugloptera



Micropterigidae



- Adults with mandibles for feeding on spores/pollen
- Larvae on liverworts
- 160 species (3 in N.America)

New Caledonia – 30+ species



Other characteristics

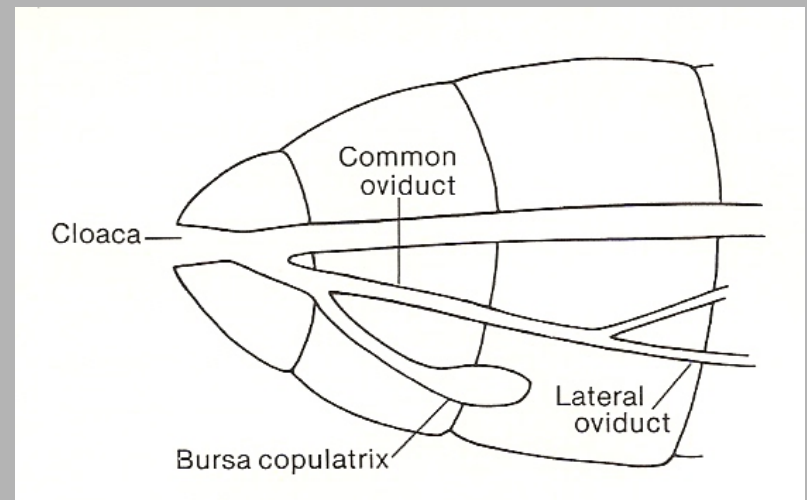
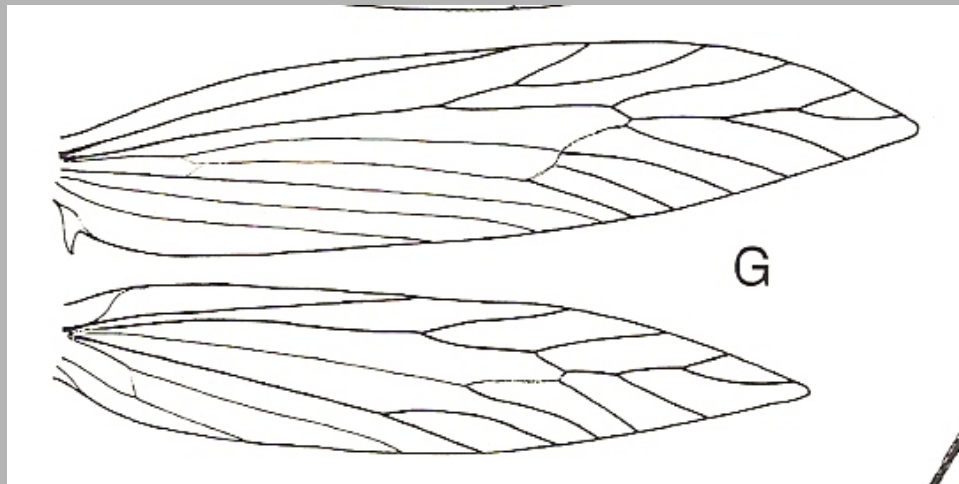
- Homoneurous wings
- Jugate forewing
- Monotrysian female reproductive system



Mike Wall - England



Cesare Brozo-Italy



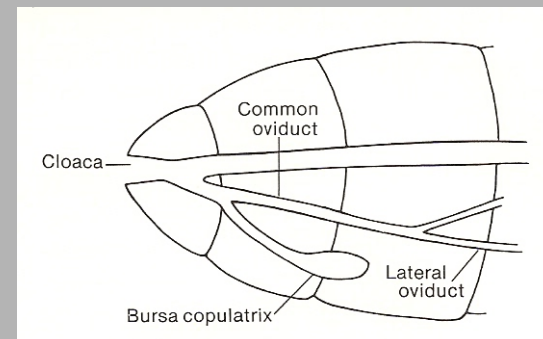
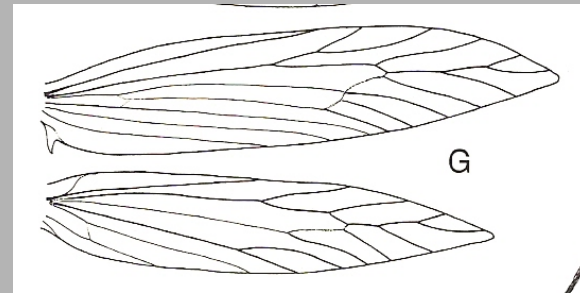
Suborder Glossata

- Linnaeus used wings for orders
- Fabricius used mouthparts
- Glossa (=proboscis) derived from maxillary galea
- Includes several phylogenetic clades



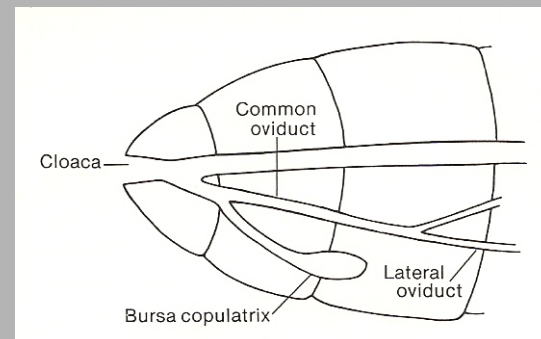
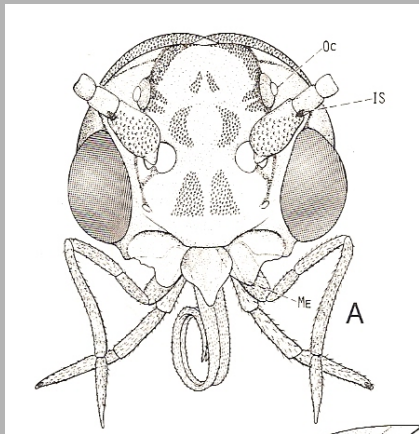
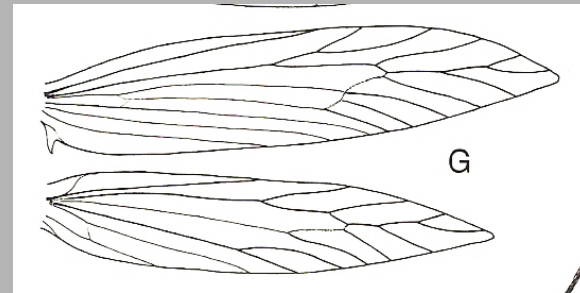
Eriocraniidae

- 29 described species
- Homoneurous wings
- Jugate forewing
- Monotrysian female



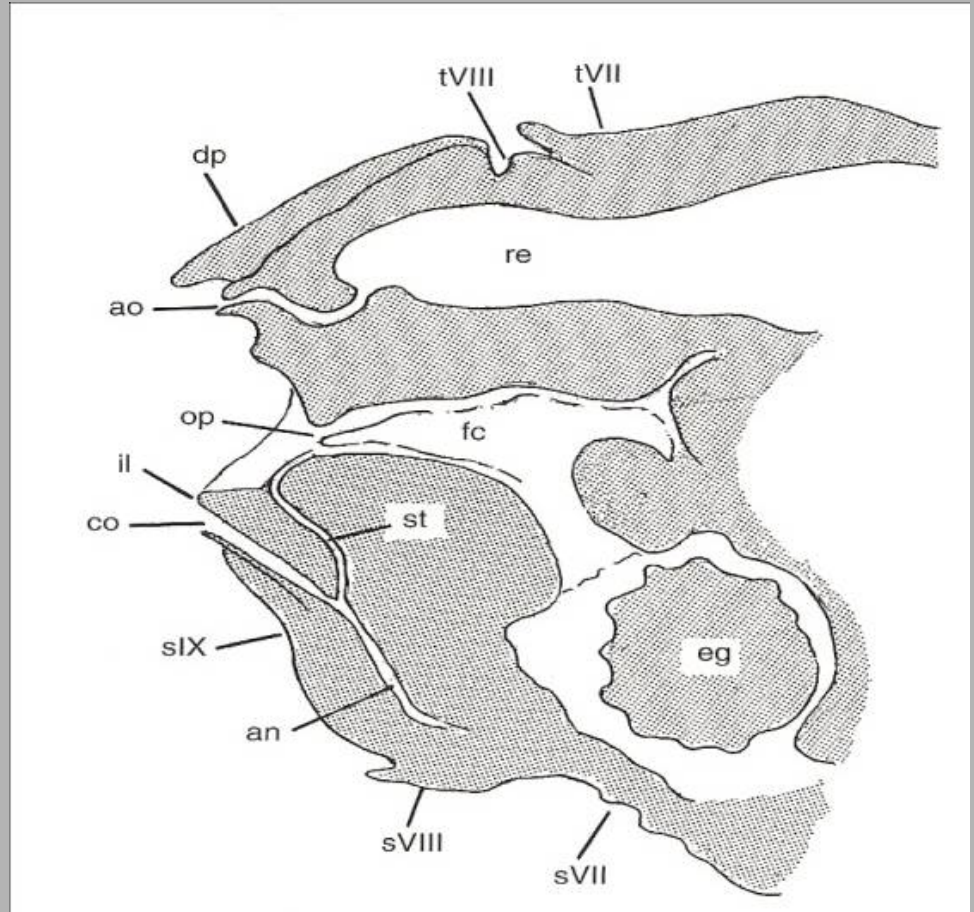
Eriocraniidae

- 24 described species
- Homoneurous wings
- Jugate wing coupling
- Monotrysian female
- Proboscis; reduced non-functional mandibles



Hepialoidea (Exoporia)

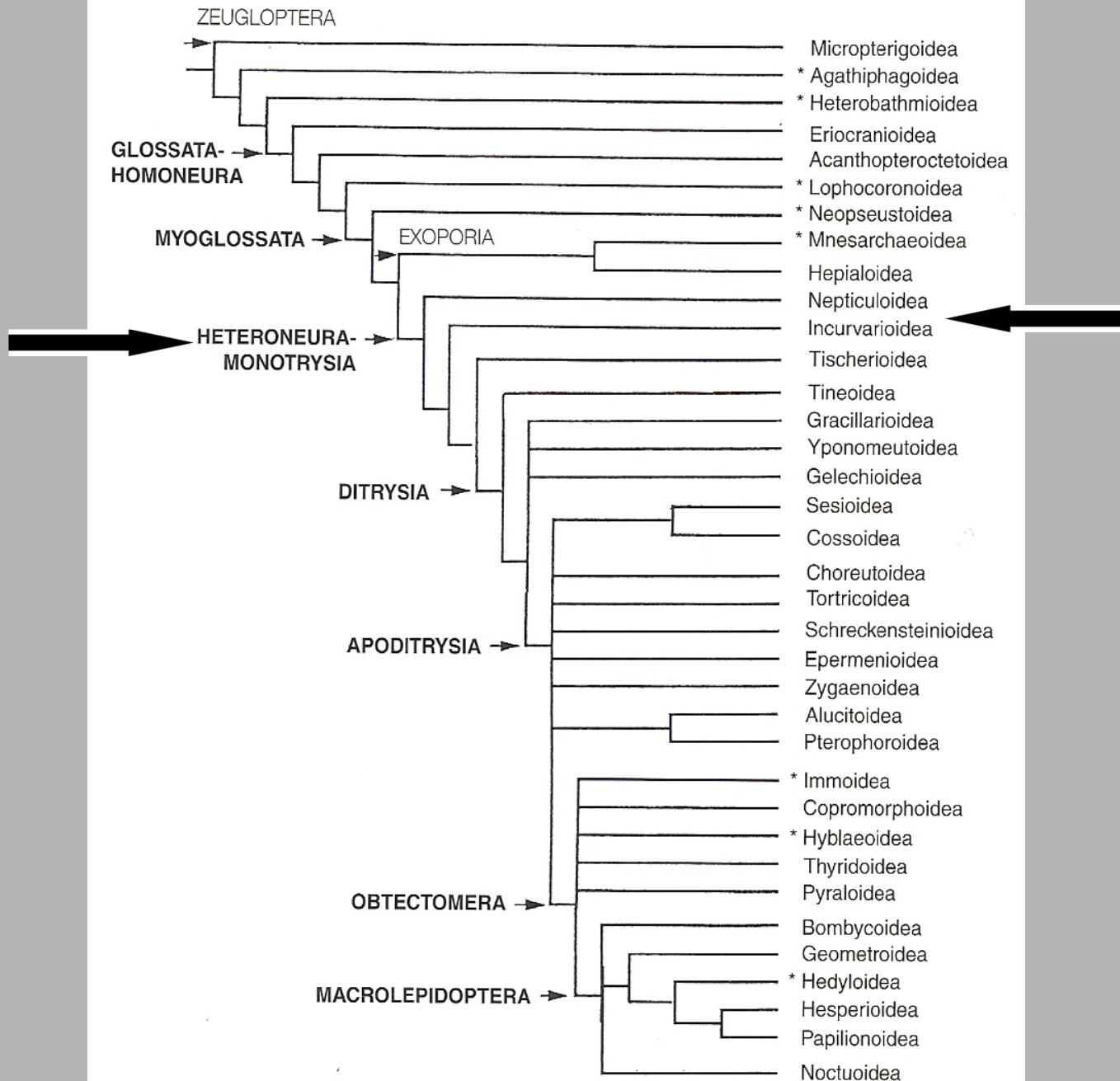
- Five families with ca. 500 species.
- Hepialidae – only family in N.A.
- Homoneurous wings
- Jugate forewing
- Exporian female reproductive system



Hepialidae

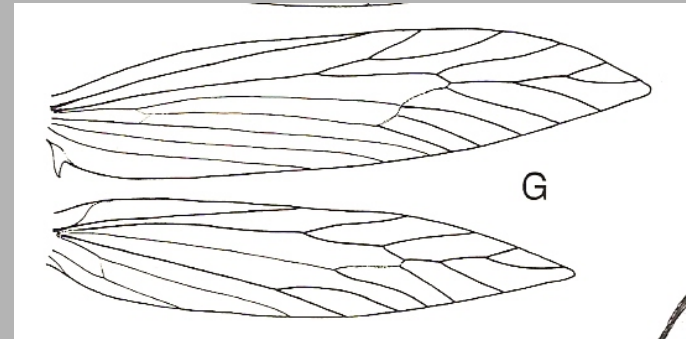
- Some spp with wingspan up to 25 mm.
- As many as 30,000 eggs “broadcast” by female in flight





Heteroneura - Monotrysia

- Heteroneurous wings
- Frenate wing coupling
- Monotrysian female reproductive system



Homoneura



Heteroneura

Nepticuloidea

- Two families: Nepticulidae, Opostegidae
- Ca. 200 described species
- Leaf miners
- Small, 1.7 mm or less



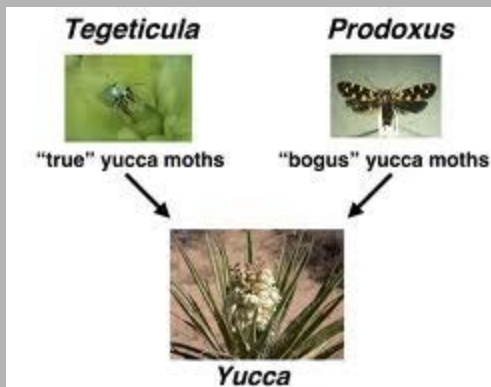
Adeloidea (=Incurvarioidea)

- 5 families with ca. 580 described species

Heliozelidae, Adelidae,
Prodoxidae, Cecidosidae,
Incurvariidae



Prodoxidae – yucca moths



Prodoxidae

- Female gathers pollen from one flower, spreads pollen and lays egg on second flower.
- Larva feeds on some of resulting seeds
- Delayed development in some species



Adelidae

- Long antennae
- 12 species in Nearctic

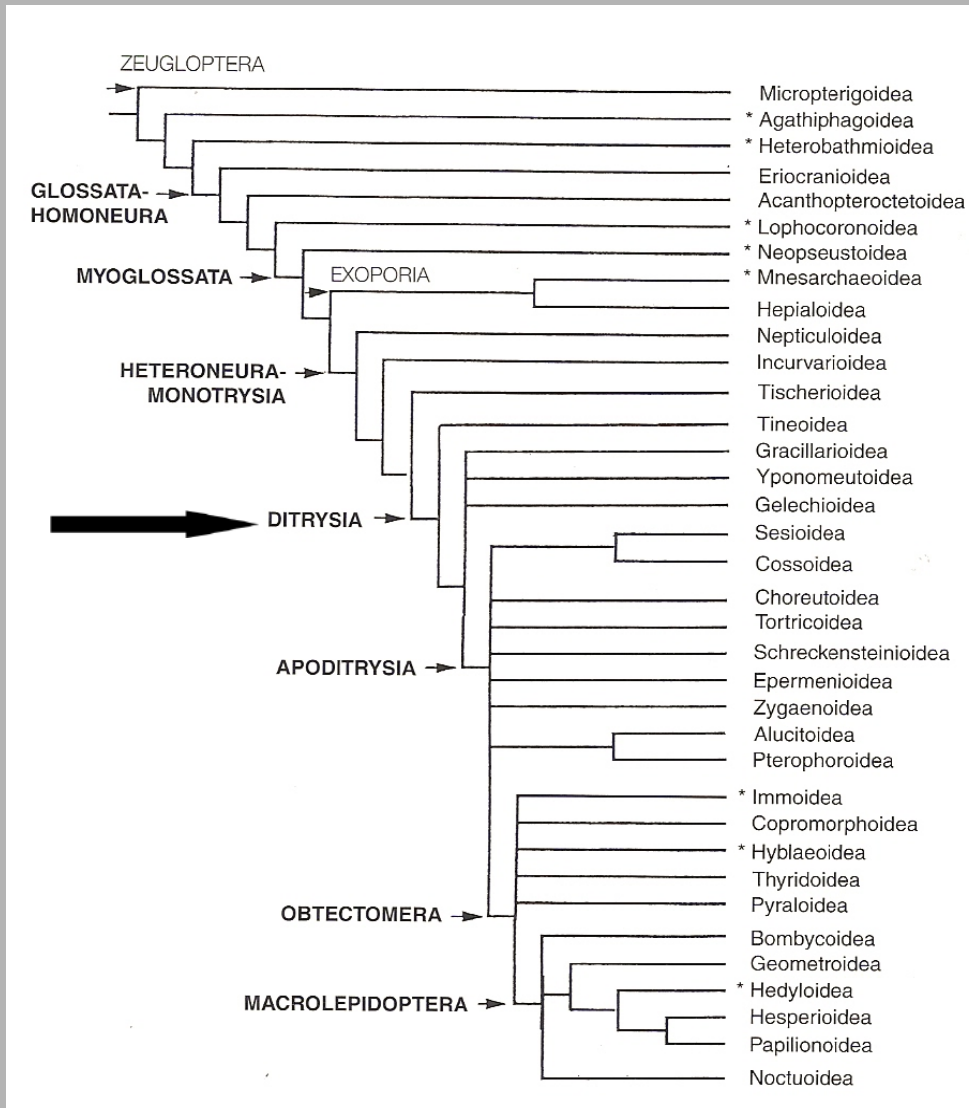


Adela flammeusella

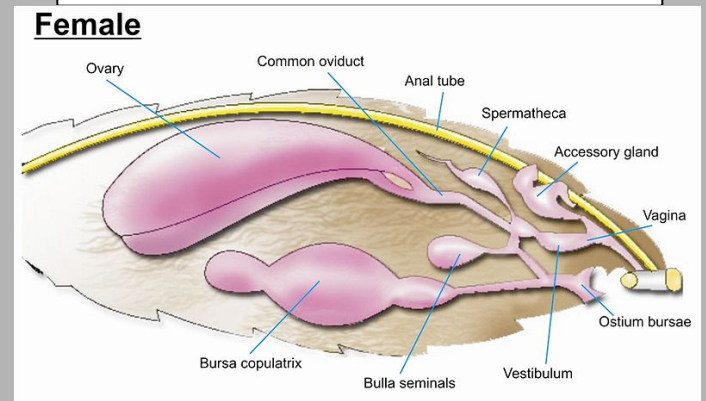
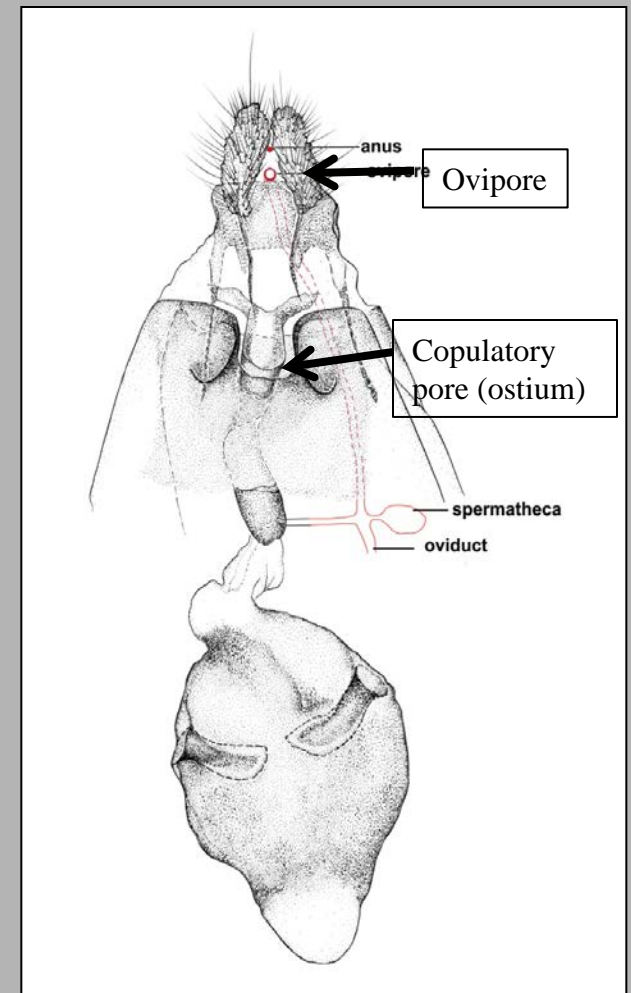
Hartmut Wisch

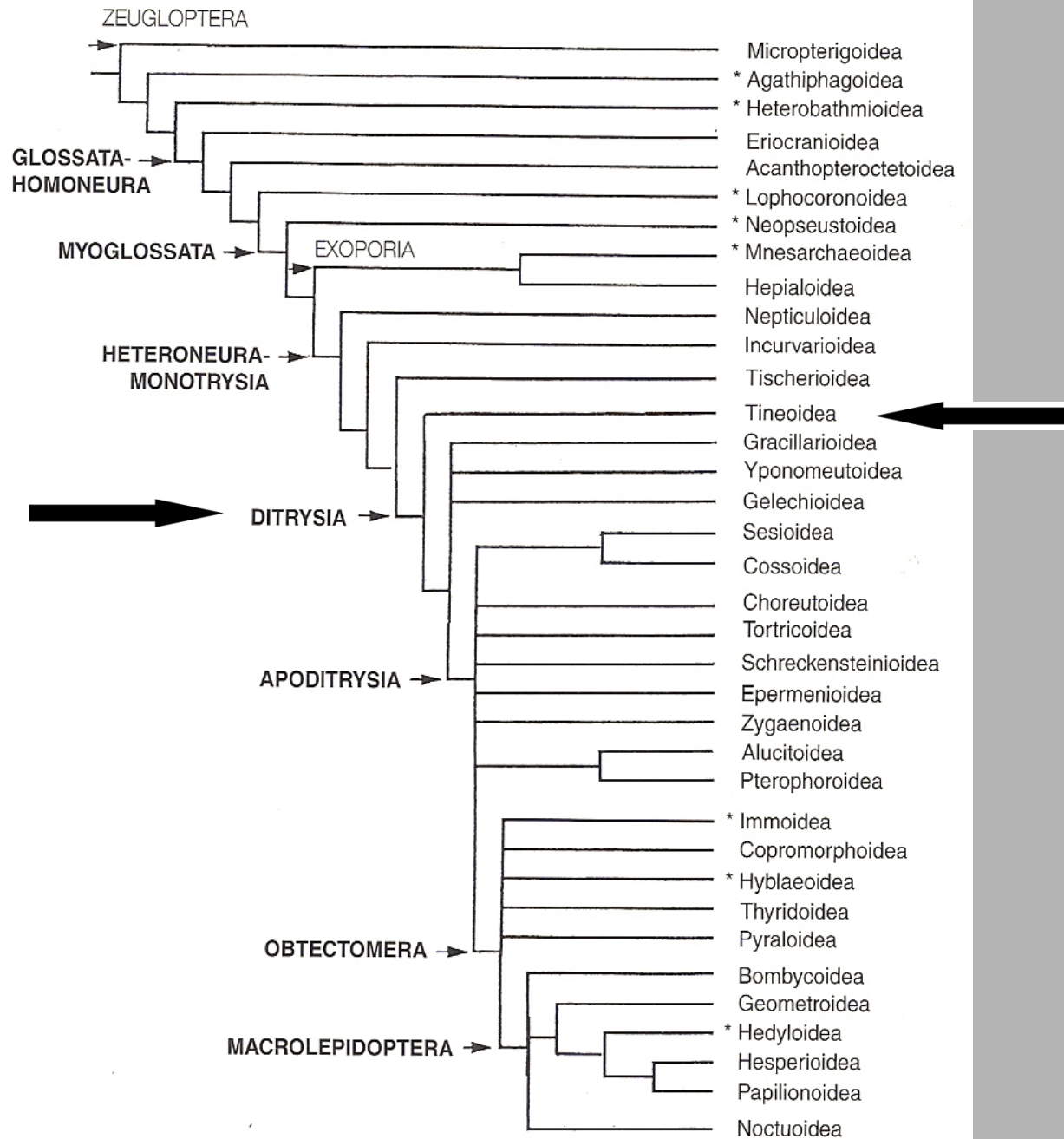


Adela rindingsella



99% of Lepidoptera





Tineiodea

- 5 families with ca. 4,200 described species

Tineidae, Psychidae,
Acrolophidae

The most primitive ditrysians



Tineidae

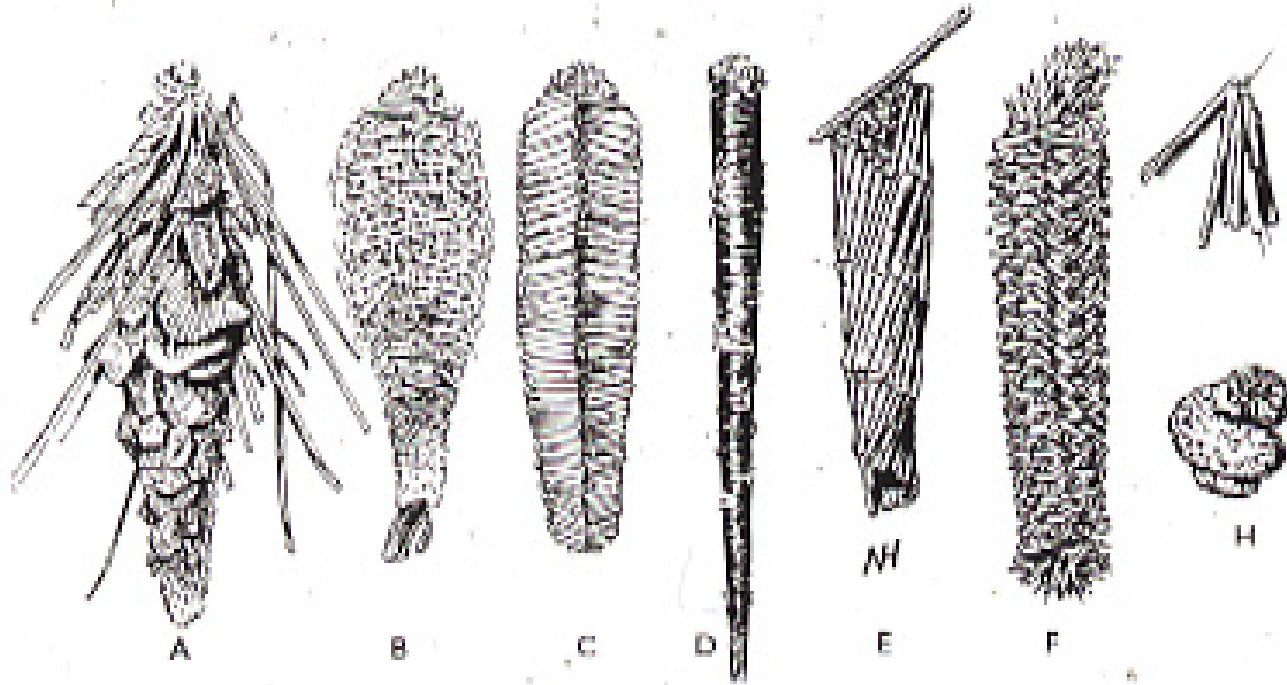
- Adult – bushy head
- Labial palpi with spiniform setae
- Larvae scavengers or fungivores
- Clothes moths

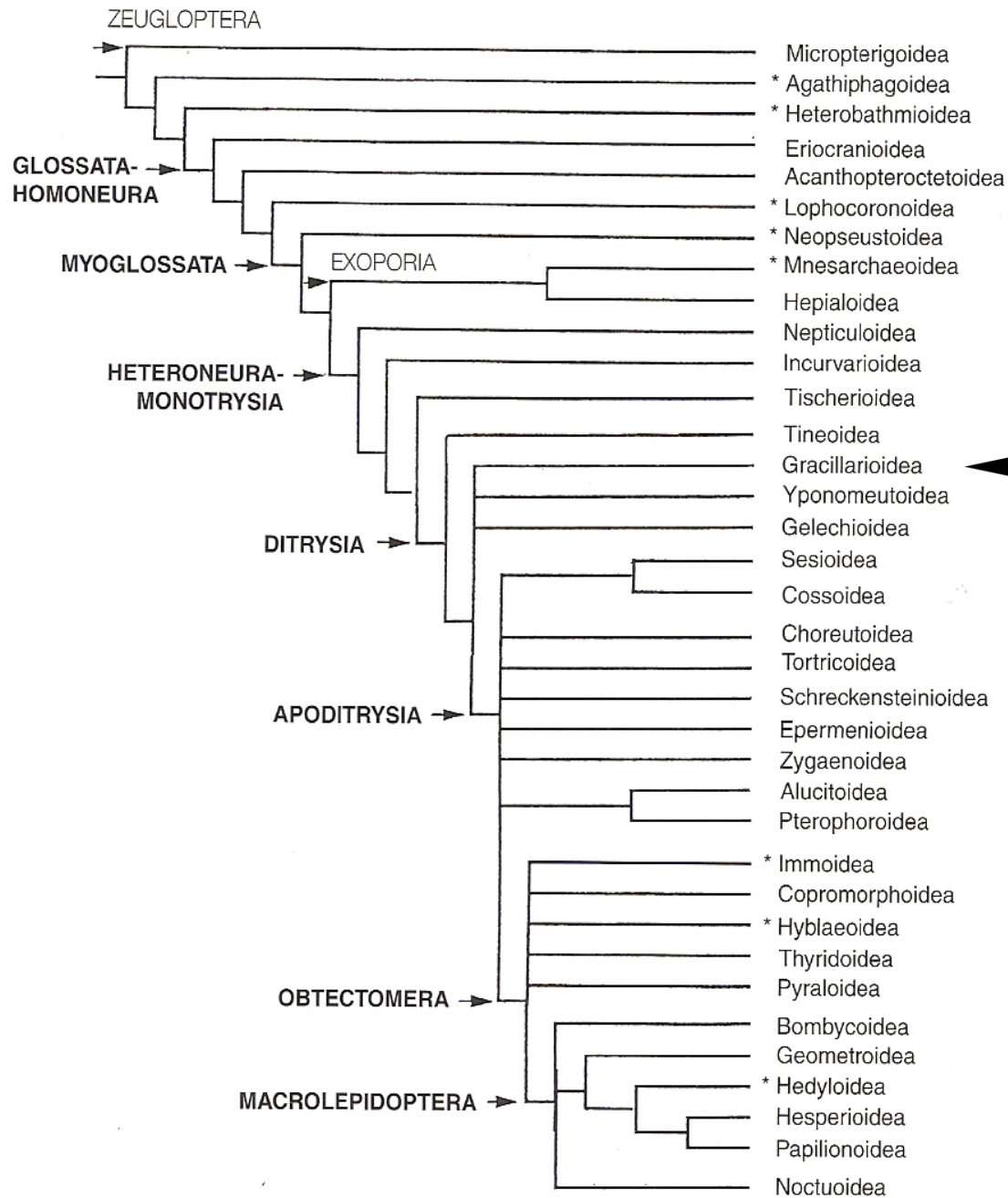


Psychidae - bagworms

- Males winged and females wingless, staying in bags
- Eggs overwinter in case
- Larvae case making, pupate in bags







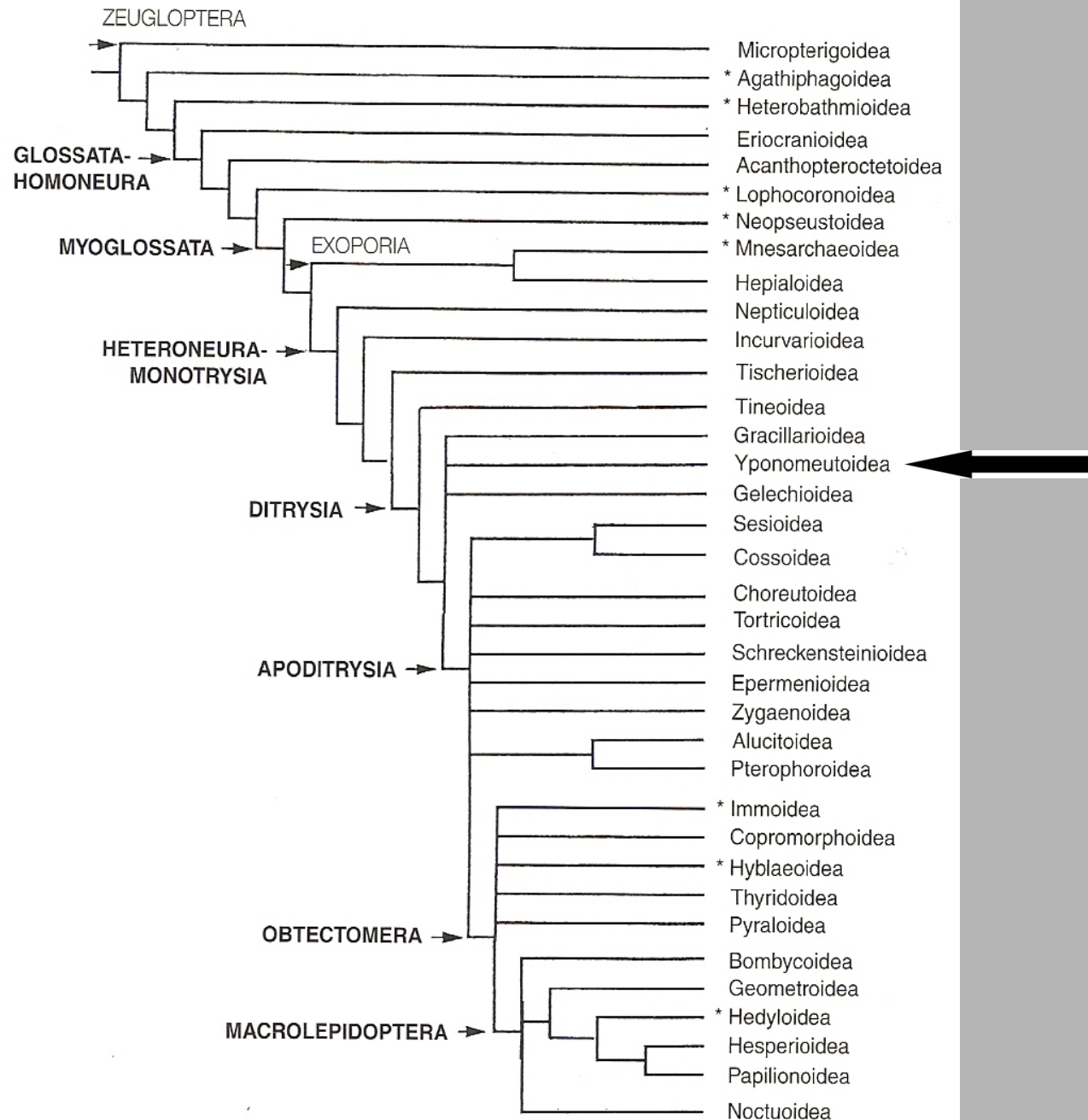
Gracillarioidea

- 3 families with ca. 2,400 described species (mostly Gracillariidae)
- Some with labial palpi similar to Tineidae



Figure 41





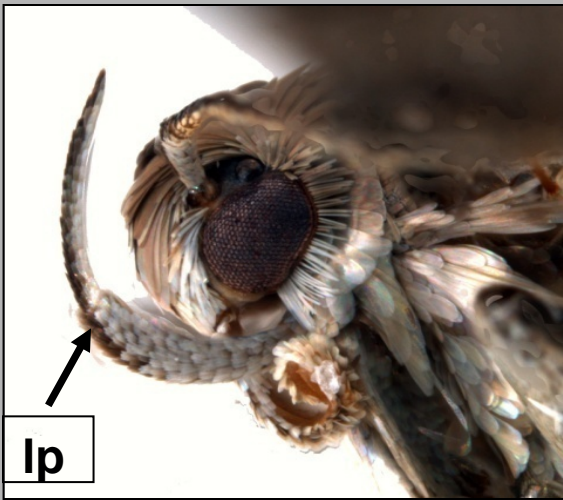
Yponomeutoidea

- 11 families with ca. 1,700 described species:
Yponomeutidae, Plutellidae, Attevidae
Ypsolophidae, Glyphipterigidae,
Argyresthiidae, Heliodinidae
- Sohn et al. (2013) – molecular phylogeny
- Autapomorphy: pleural lobes just before genitalia – posterior expansion of pleuron VIII



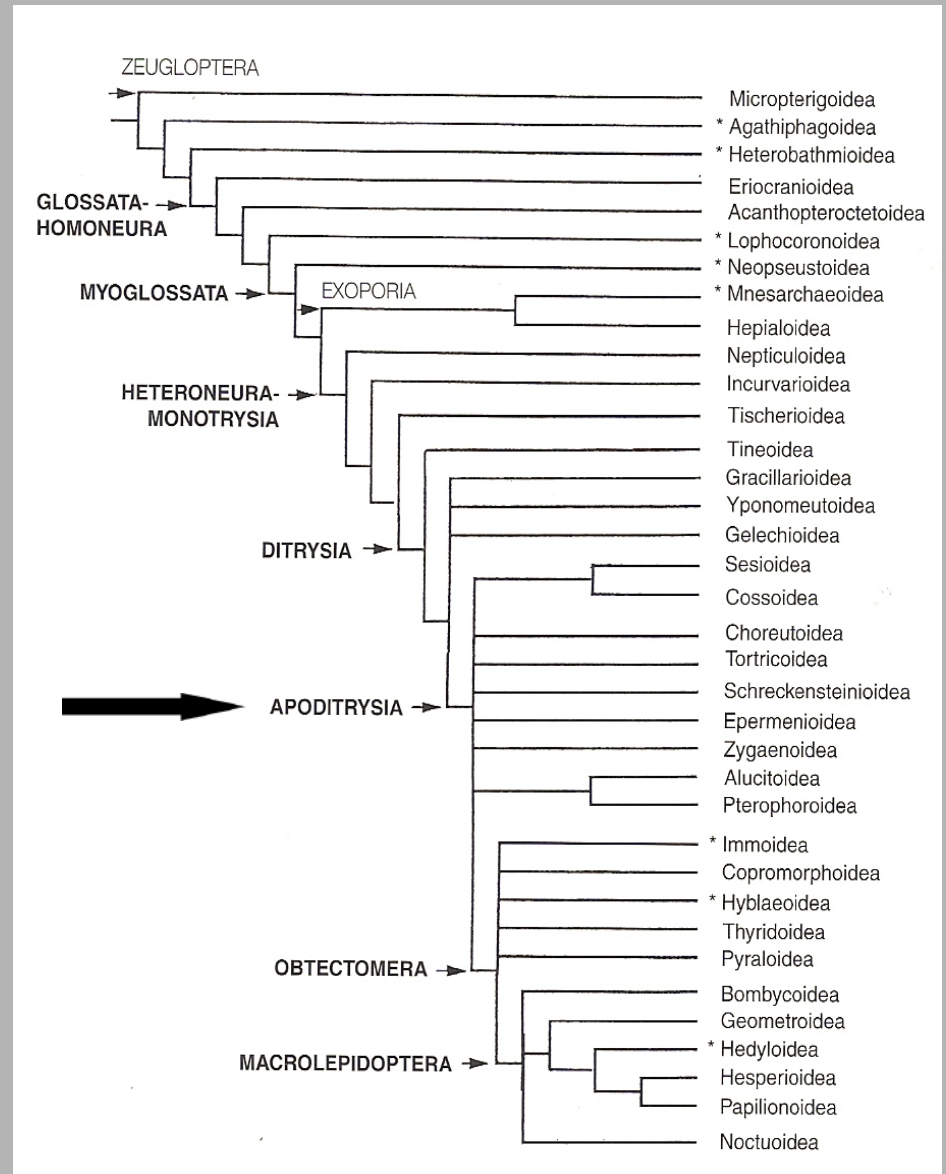
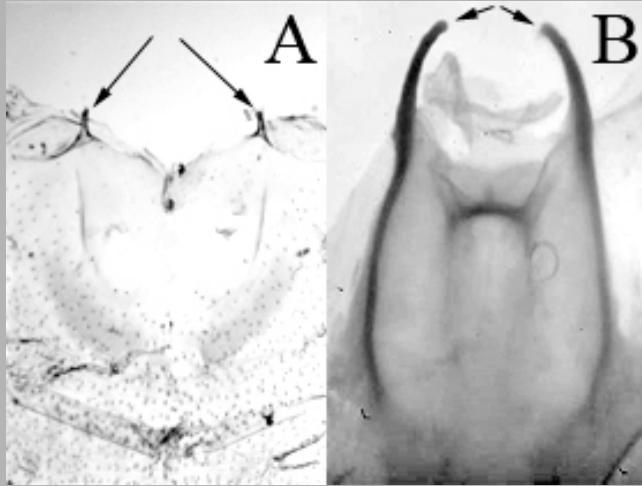
Superfamily Gelechioidea

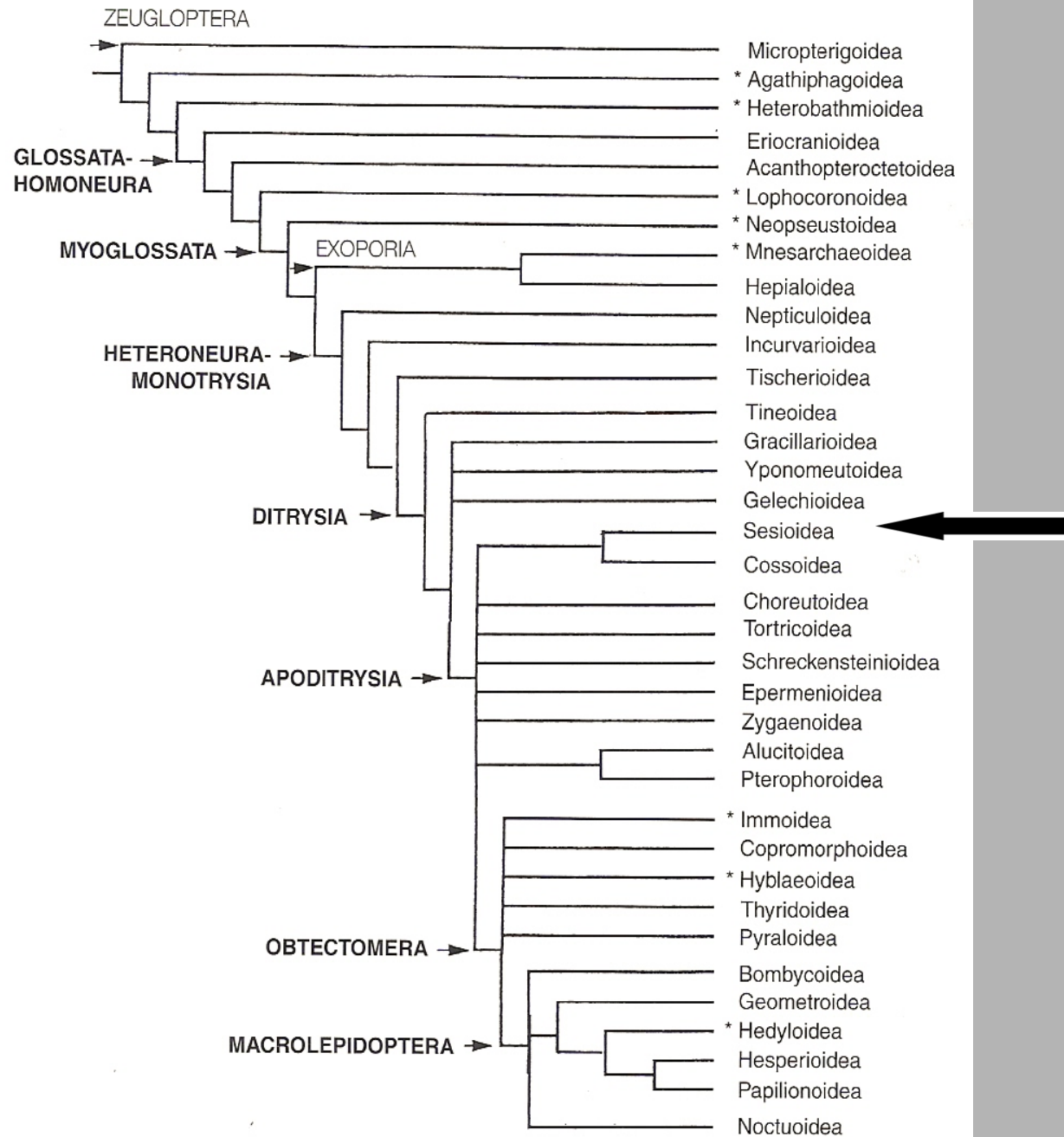
- SangMi Lee



Apoditrysia

Clade of ditrysian moths with apomorphic sternum II having short apodemes (A), not long venulae (B)





Cossoidea

- 7 families with ca. 2,900 species
- Sesiidae, Cossidae, Castniidae
- Larvae in stems/roots; mostly woody shrubs or woody herbs



Sesiidae

Wasp and bee mimics

Usually with clear wings

Diurnally active

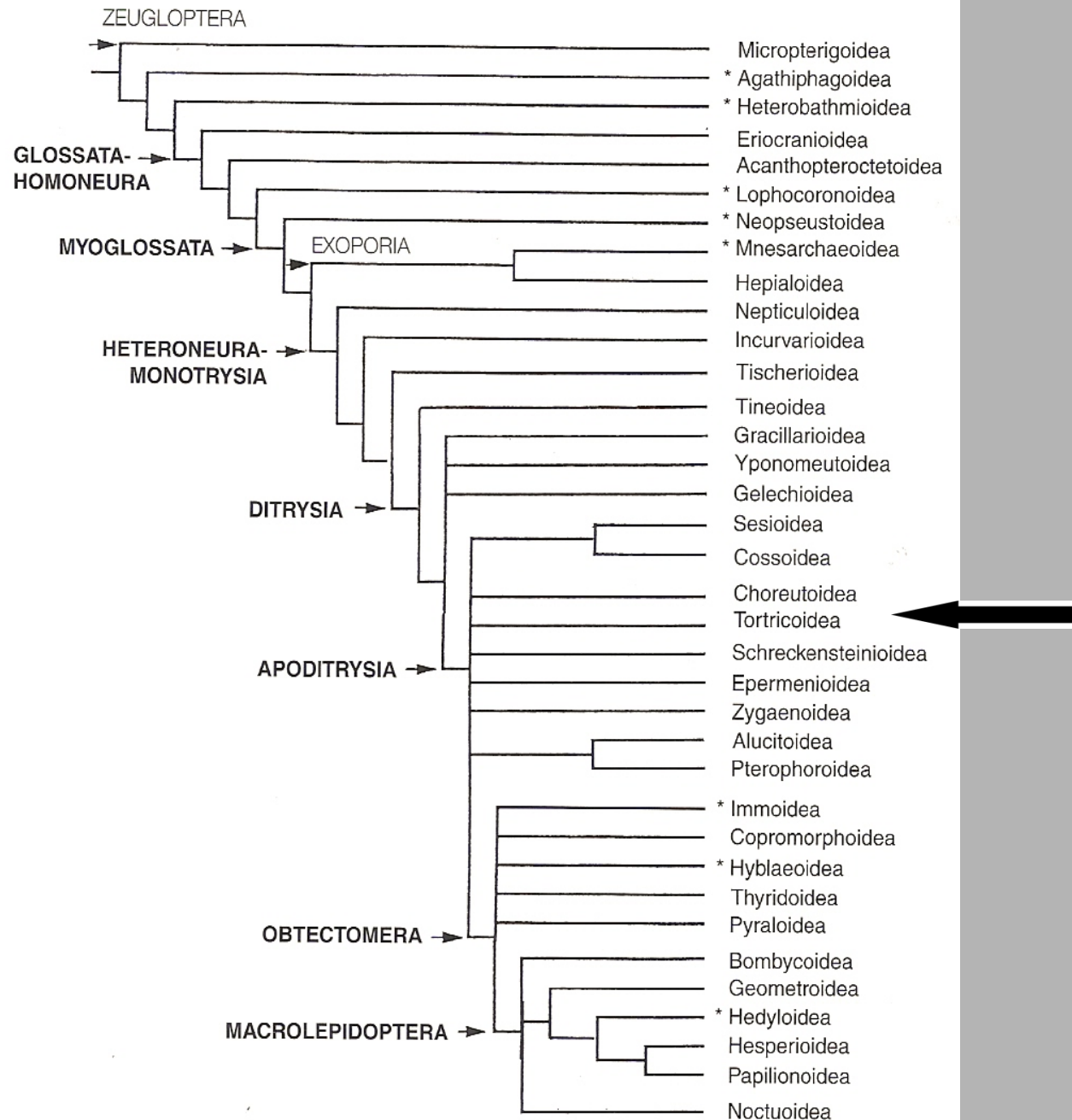
Most easily collected using
artificial male pheromones

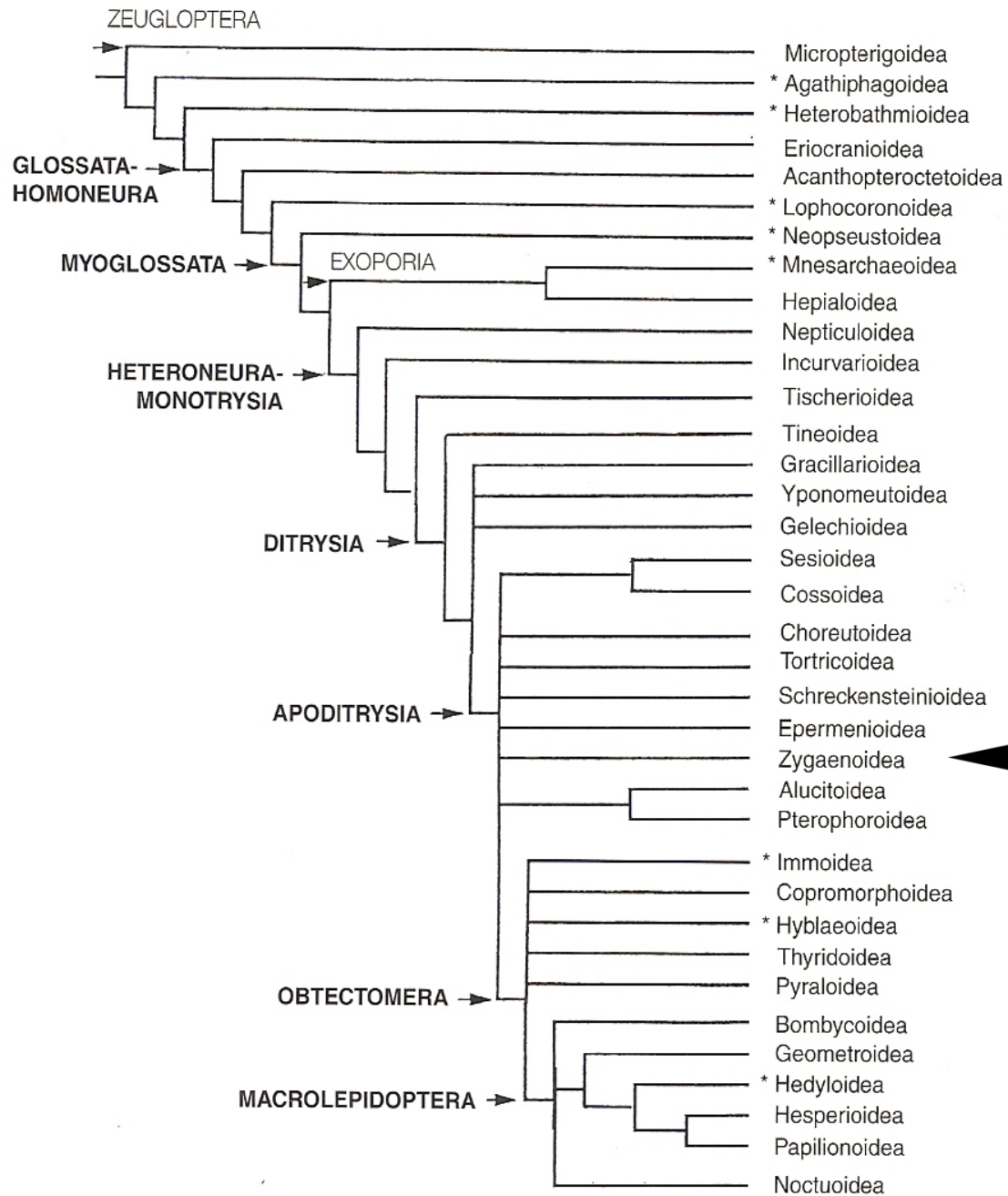


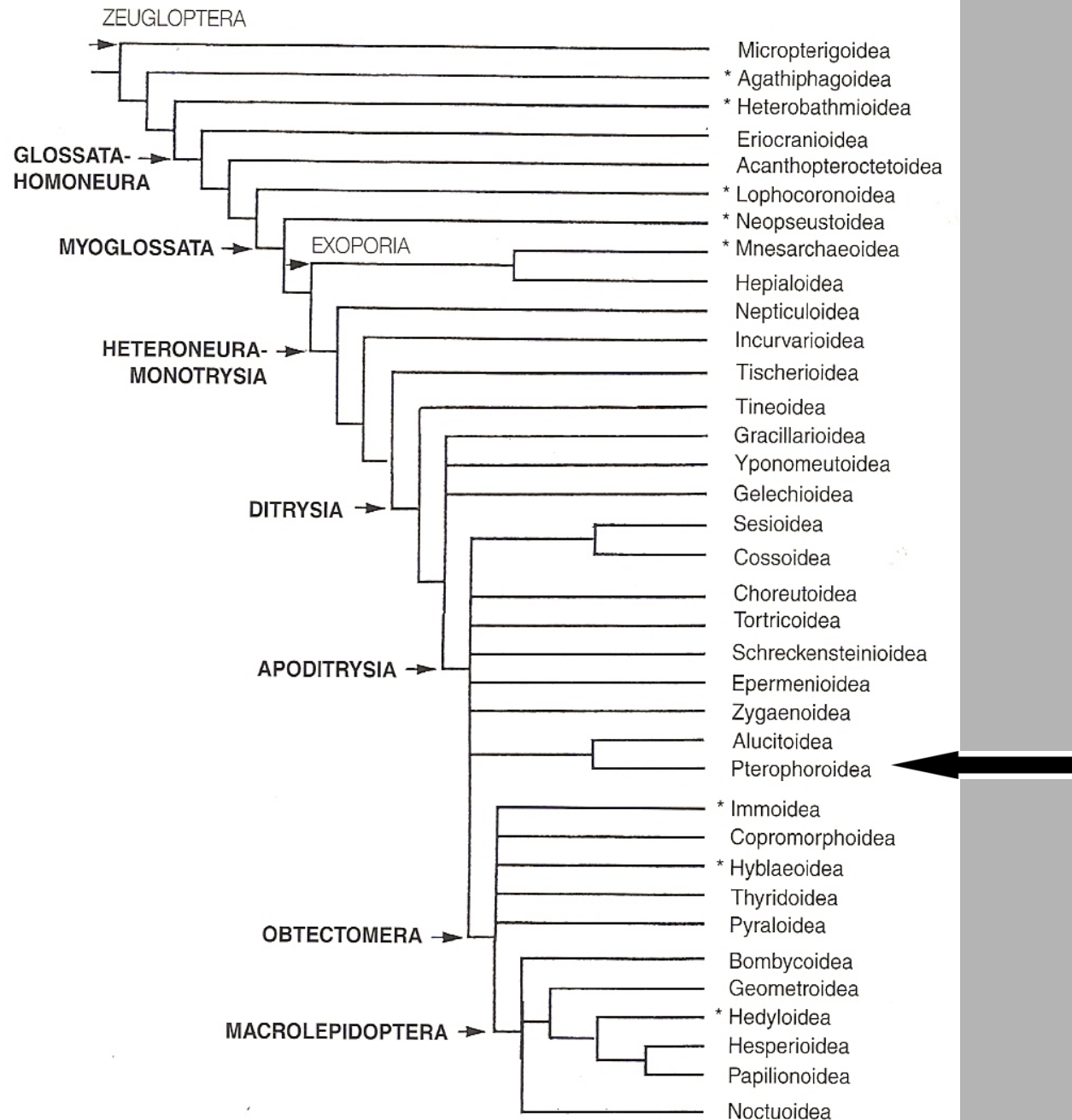
Cossidae - carpenter moths

- Adults often with striate wing pattern
- Larvae boring in stems/trunks of shrubs and trees



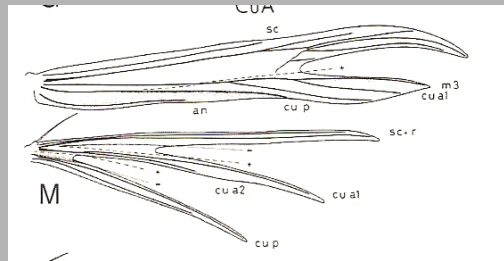






Pterophoroidea - Pterophoridae

- 1,300 described species
- Characteristically incised wings
- Long slender legs
- Distinctive resting posture



Pterophoridae - plume moths

- Some internal borers



Obtectomera

- Pyraloidea
 - Papilionoidea
 - Macroheterocera
-
- Pupae with abdominal segments less movable.
 - Spines on abdomen absent.
 - Pupa not extruding from pupation site.



Future Lectures on Microlepidoptera

- Gelechioidea
- Tortricoidea
- Zygaenoidea
- Pyraloidea